

Work Order ID 114479

Thursday, March 06, 2014 11:37:44 AM

114479

Page 1

Item ID: D212-664-201

Revision ID:

Item Name: Aft Crosstube - High

Start Date: 3/6/2014 Start Qty: 1.00

Required Date: 3/12/2014 Req'd Qty: 1.00

Reference:

Accept

N900040100

Setup Start *NS1*

Stop *NS2*

Cust Item ID:

Customer:

Approvals: Process Plan: Date: 14-03-06

QC: Date:

Tooling: Date:

SPC (Y/N): Date:

Run Start *NR1*

Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
D212-664-241	Rev D (DEO)
DSI9563	B

100 Document Control
DOCUMENT CONTROL

100

DC

Doc.Control -USB or Paperwork

Memo

Photocopy bluefile and create labels as per PPP D212-664-201 CHG005

0.00 DAS
06
9-89

MAR 27 2014

0.00

110 Pick Kit
Packaging

110

Packaging

Packaging

Memo

0.00

0.00

 14-03-06

Pto →

DQA:

Date: 14/04/09

QA Closed:

Date: 14-4-11

WORK ORDER NON-CONFORMANCE / UPDATE

Work Order update only ☐

Work Order: 11 79	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input checked="" type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS			
Part No. 02 664-201		Skid-tube <input type="checkbox"/>	Crosstube <input checked="" type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>
NCR No. 14 097		Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>
		Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>
		Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	

Root Cause	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design <input type="checkbox"/>								
Doc/Data <input type="checkbox"/>								
Equip/Tooling <input type="checkbox"/>								
Handling/Pre <input type="checkbox"/>								
Material <input type="checkbox"/>								
Operator <input type="checkbox"/>								
Offset/Setup <input type="checkbox"/>								
Process <input checked="" type="checkbox"/>								
Supplier <input type="checkbox"/>								
Training <input type="checkbox"/>								
Transport <input type="checkbox"/>								
Unapproved <input type="checkbox"/>								

FAULT CATEGORY

Landing Gear <input checked="" type="checkbox"/> Bearing <input type="checkbox"/> Center Not Concentric <input type="checkbox"/> Cracks <input type="checkbox"/> Creep/Kink/Ripple/Wave <input type="checkbox"/> Cupping <input type="checkbox"/> Cracking <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Misalignment/Chatter <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Warpage/Twist in Tube	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge	<input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
---	--	---	--	--

Work Order ID 114479

Thursday, March 06, 2014 11:37:45 AM

114479

Page 2

Item ID: D212-664-201

Revision ID:

Item Name: Aft Crosstube - High

Start Date: 3/6/2014 Start Qty: 1.00 *1*

Required Date: 3/12/2014 Req'd Qty: 1.00 *1*

Reference:

Accept

N900040100Setup Start ***NS1***Stop ***NS2***

Cust Item ID:

Customer:

Approvals: Process Plan: _____ Date: _____

QC: _____ Date: _____

Tooling: _____ Date: _____

SPC (Y/N): _____ Date: _____

Run Start ***NR1***Stop ***NR2***Sequence ID/
Work Center ID

120

120

CNC Bend 2

CNC Alpha 160 Bender

Operation
Description

BENDING MACHINE - CROSSTUBES

Memo

***VERF SET-UP BEFORE BENDING BY: JW ***

Bend tube as per Dwg D212-664-241 using CNC bender program 212-aft

Set Up/
Run Hours

0.00

0.00

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
StampJW 14-03-06

130

130

QC

Quality Control

QC15- Crosstube Dimensional Check

Memo

0.00

0.00

DAS

16

9-89 14/03/10

DQA: _____ Date: _____

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <table style="width: 100%;"> <tr> <td style="width: 25%;">Skid-tube <input type="checkbox"/></td> <td style="width: 25%;">Crosstube <input type="checkbox"/></td> <td style="width: 25%;">Water Jet <input type="checkbox"/></td> <td style="width: 25%;">Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief-Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	<input type="checkbox"/>								
Doc/Data	<input type="checkbox"/>								
Equip/Tooling	<input type="checkbox"/>								
Handling/Pre	<input type="checkbox"/>								
Material	<input type="checkbox"/>								
Operator	<input type="checkbox"/>								
Offset/Setup	<input type="checkbox"/>								
Process	<input type="checkbox"/>								
Supplier	<input type="checkbox"/>								
Training	<input type="checkbox"/>								
Transport	<input type="checkbox"/>								
Unapproved	<input type="checkbox"/>								

FAULT CATEGORY

Landing Gear <input type="checkbox"/> Bearing <input type="checkbox"/> Center Not Concentric <input type="checkbox"/> Crack <input type="checkbox"/> Creep/Kink/Ripple/Wave <input type="checkbox"/> Curvature <input type="checkbox"/> Cracking <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Misalignment/Chatter <input type="checkbox"/> Timing Sequence <input type="checkbox"/> Twist in Tube	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence
<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge		
<input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other		

Work Order ID 114479

Thursday, March 06, 2014 11:37:45 AM

114479

Page 3

Item ID: D212-664-201

Accept

N900040100

Setup Start

NS1

Revision ID:

Stop

NS2

Item Name: Aft Crosstube - High

Start Date: 3/6/2014 Start Qty: 1.00

1

Cust Item ID:

Required Date: 3/12/2014 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

NR1

QC:

Date:

SPC (Y/N):

Date:

Stop

NR2Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

140

140

Crosstubes

Crosstubes

Crosstubes

Memo

0.00

1-Drill pilot holes in tube as per Dwg D212-664-241 using drill Jig DT8550, DT8551, drill table DT8577 and locate tower holes #8 as per QSI0010.

2-Ream hole to finish size in tube as per Dwg D212-664-241 using drill Jig DT8550 & DT8551. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.

3-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-241

4. ***WEAR LATEX GLOVES HANDLING CROSSTUBE.*** Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-241

14-03-10

14-03-11

150

150

QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.

DAS

27

9:39

14/3/12

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <div style="display: flex; justify-content: space-between;"> <div> Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Thermoforming <input type="checkbox"/> Large Fab <input type="checkbox"/> </div> <div> Crosstube <input type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> Composite <input type="checkbox"/> </div> <div> Water Jet <input type="checkbox"/> Prod. Eng. Coord. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/> </div> <div> Engineering <input type="checkbox"/> Quality <input type="checkbox"/> Other <input type="checkbox"/> </div> </div>
--	--	---

Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	<input type="checkbox"/>								
Doc/Data	<input type="checkbox"/>								
Equip/Tooling	<input type="checkbox"/>								
Handling/Pre	<input type="checkbox"/>								
Material	<input type="checkbox"/>								
Operator	<input type="checkbox"/>								
Offset/Setup	<input type="checkbox"/>								
Process	<input type="checkbox"/>								
Supplier	<input type="checkbox"/>								
Training	<input type="checkbox"/>								
Transport	<input type="checkbox"/>								
Unapproved	<input type="checkbox"/>								

FAULT CATEGORY

Landing Gear <input type="checkbox"/> Bearing <input type="checkbox"/> Center Not Concentric <input type="checkbox"/> Cracks <input type="checkbox"/> Critical/Kink/Ripple/Wave <input type="checkbox"/> Cuff <input type="checkbox"/> Cracking <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Malfunction/Chatter <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Warpage/Twist in Tube	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
---	--	---

Work Order ID 114479

Thursday, March 06, 2014 11:37:45 AM

114479

Page 4

Item ID: D212-664-201

Accept

N900040100Setup Start ***NS1***

Revision ID:

Item Name: Aft Crosstube - High

Stop ***NS2***

Start Date: 3/6/2014 Start Qty: 1.00

1

Cust Item ID:

Required Date: 3/12/2014 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
160		0.00							
160									
HandFXtube	Memo	0.00							
Hand Finishing Crosstubes	***WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.***								
	1- CLEAN CROSSTUBE WITH WASH'N WIPE								
180	Outsource process - NDT per QSI038 4.1	0.00							
180									
Outsource2	Memo	0.00							
Outsource process - NDT	***WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.***								
	Liquid Penetrant Inspection as per QSI 038								
	Issue P/O: 23357								
	LPI as per ASTM 1417 Level 2								
	Attach copy of NDT results to work order								
190	Receive & Inspect for Damage & Mat'l Certs	0.00							
190	Packaging								
Packaging	Memo	0.00							
Packaging	***WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE.***								
	Ensure copy of NDT results attached to work order.								

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <table style="width: 100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design <input type="checkbox"/>									
Doc/Data <input type="checkbox"/>									
Equip/Tooling <input type="checkbox"/>									
Handling/Pre <input type="checkbox"/>									
Material <input type="checkbox"/>									
Operator <input type="checkbox"/>									
Offset/Setup <input type="checkbox"/>									
Process <input type="checkbox"/>									
Supplier <input type="checkbox"/>									
Training <input type="checkbox"/>									
Transport <input type="checkbox"/>									
Unapproved <input type="checkbox"/>									

FAULT CATEGORY

Landing Gear <input type="checkbox"/> Berig <input type="checkbox"/> Cer Not Concentric <input type="checkbox"/> Cra <input type="checkbox"/> Cri /Kink/Ripple/Wave <input type="checkbox"/> Cuf <input type="checkbox"/> Cru ng <input type="checkbox"/> He reat <input type="checkbox"/> Ins tion Strip in Tube <input type="checkbox"/> Ma /Chatter <input type="checkbox"/> Tui g Sequence <input type="checkbox"/> Wa /Twist in Tube	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
---	--	---	--

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____ Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <table style="width: 100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	<input type="checkbox"/>								
Doc/Data	<input type="checkbox"/>								
Equip/Tooling	<input type="checkbox"/>								
Handling/Pre	<input type="checkbox"/>								
Material	<input type="checkbox"/>								
Operator	<input type="checkbox"/>								
Offset/Setup	<input type="checkbox"/>								
Process	<input type="checkbox"/>								
Supplier	<input type="checkbox"/>								
Training	<input type="checkbox"/>								
Transport	<input type="checkbox"/>								
Unapproved	<input type="checkbox"/>								

FAULT CATEGORY

Landing Gear <input type="checkbox"/> Berig <input type="checkbox"/> Cer Not Concentric <input type="checkbox"/> Cra <input type="checkbox"/> Crii 'Kink/Ripple/Wave <input type="checkbox"/> Cuf <input type="checkbox"/> Cru ng <input type="checkbox"/> Hea reat <input type="checkbox"/> Insj tion Strip in Tube <input type="checkbox"/> Ma /Chatter <input type="checkbox"/> Tur g Sequence <input type="checkbox"/> We 'Twist in Tube	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
--	--	---	--

Work Order ID 114479***114479***

Page 6

Thursday, March 06, 2014 11:37:45 AM

Item ID: D212-664-201

Accept

N900040100Setup Start ***NS1***

Revision ID:

Item Name: Aft Crosstube - High

Stop ***NS2***

Start Date: 3/6/2014 Start Qty: 1.00

1

Cust Item ID:

Required Date: 3/12/2014 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

210

Spray Painting per QSI005 4.2

0.00

210

SprayPaint

SprayPaint

Memo

0.00

Spray Painting

*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

CA 14-03-17

PTD

1-Prime inside and outside crosstube as per QSI 005 4.2

PRIME BATCH: 126878

Start Time: 10:30

Finish Time: 11:00

MASK UNDERSIDE OF CROSSTUBE AS SHOWN ON DWG DEO

2-Paint outside crosstube with White Imron as per QSI 005 4.2

PAINT BATCH: m 120330

Start Time: 7:00

Finish Time: 7:30

CA 14-03-20

3- Remove masking and apply matte clear coat as per dwg DEO

CLEAR BATCH: 125473

- AB 14-3-19

DQA:

Date: 12/04/09



QA Closed:

Date: 12/14/14

WORK ORDER NON-CONFORMANCE / UPDATE

Work Order update only ☐

Work Order: 1 479	DISPOSITION Rework <input checked="" type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS			
Part No. D2 2-664-201		Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>
NCR No. 14 3698		Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>
		Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>
		Large Fab <input type="checkbox"/>	Composite <input checked="" type="checkbox"/>	Supplier <input type="checkbox"/>	

Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design									
Doc/Data									
Equip/Tooling									
Handling/Pre									
Material									
Operator									
Offset/Setup									
Process	<input checked="" type="checkbox"/>								
Supplier									
Training									
Transport									
Unapproved									

FAULT CATEGORY

Landing Gear	General
<input type="checkbox"/> Berig	<input type="checkbox"/> Bend
<input type="checkbox"/> Cer Not Concentric	<input type="checkbox"/> BOM/Route
<input type="checkbox"/> Cra	<input type="checkbox"/> Broken/Damage/Defect
<input type="checkbox"/> Crir 'Kink/Ripple/Wave	<input type="checkbox"/> Burrs
<input type="checkbox"/> Cuf	<input type="checkbox"/> Contamination
<input type="checkbox"/> Cru ng	<input type="checkbox"/> Countersink
<input type="checkbox"/> Hea reat	<input type="checkbox"/> Cut Too Short
<input type="checkbox"/> Ins tion Strip in Tube	<input type="checkbox"/> Drawing
<input type="checkbox"/> Ma /Chatter	<input type="checkbox"/> Drill Holes
<input type="checkbox"/> Tur g Sequence	<input type="checkbox"/> Finish
<input type="checkbox"/> Wa 'Twist in Tube	<input type="checkbox"/> Fit/Function
	<input type="checkbox"/> Folio/Program
	<input type="checkbox"/> Grain
	<input type="checkbox"/> Hardware
	<input type="checkbox"/> Inspection Incomplete/Unqualified
	<input type="checkbox"/> Instructions Incomplete/Unclear
	<input type="checkbox"/> Misaligned/off center
	<input type="checkbox"/> Mislabeled
	<input type="checkbox"/> Misread
	<input type="checkbox"/> Off-set
	<input type="checkbox"/> Out of Calibration
	<input type="checkbox"/> Out of Sequence
	<input type="checkbox"/> Outside Dimensions
	<input type="checkbox"/> Over/Under tolerance
	<input type="checkbox"/> Part Incorrect
	<input type="checkbox"/> Part Lost/Missing
	<input type="checkbox"/> Part Moved
	<input type="checkbox"/> Positioned Wrong
	<input type="checkbox"/> Power Loss/Surge
	<input type="checkbox"/> Pressure/Forced
	<input type="checkbox"/> Set-up
	<input checked="" type="checkbox"/> Temperature/Cure
	<input type="checkbox"/> Weld
	<input type="checkbox"/> Wrong Stock Pulled
	<input type="checkbox"/> Other

DOOR SHOULD BE LOCKED OUT
SIMILAR TO WHEN THERMOFORMING
BEING CARRIED OUT.

Work Order ID 114479

Thursday, March 06, 2014 11:37:45 AM

114479

Page 7

Item ID: D212-664-201 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: Aft Crosstube - High
 Start Date: 3/6/2014 Start Qty: 1.00 ***1*** Cust Item ID:
 Required Date: 3/12/2014 Req'd Qty: 1.00 ***1*** Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
220 *220* QC Quality Control	QC14- Inspect Spray Paint Memo Then, Wrap in plastic bag to protect from scratches	0.00 0.16 9-89 14/03/21							
230 *230* Crosstubes Crosstubes	Crosstubes Memo 1-Abrade mating surfaces of support and crosstube with 180 grit sandpaper, clean the area with MEK or equivalent as per dwg 2-Install supports with Proseal 890 per D212-664-241 (DEO) and QSI 015 A/R Proseal 890 Batch: <u>127662</u> EXP: <u>4/14</u> 3-Install supports clamps Using Dt9565 as per Dwg D212-664-241 (DEO), Torque to 80-100 IN-LBS. PROSEAL CURE TIME 72 HOURS: Start: <u>10:00</u> Finish: <u>10:40</u>	0.00 0.00				1	0	0	14-3-22

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____ Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <div style="display: flex; justify-content: space-between;"> <div> Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Thermoforming <input type="checkbox"/> Large Fab <input type="checkbox"/> </div> <div> Crosstube <input type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> Composite <input type="checkbox"/> </div> <div> Water Jet <input type="checkbox"/> Prod. Eng. Coord. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/> </div> <div> Engineering <input type="checkbox"/> Quality <input type="checkbox"/> Other <input type="checkbox"/> </div> </div>
--	--	---

Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	<input type="checkbox"/>								
Doc/Data	<input type="checkbox"/>								
Equip/Tooling	<input type="checkbox"/>								
Handling/Pre	<input type="checkbox"/>								
Material	<input type="checkbox"/>								
Operator	<input type="checkbox"/>								
Offset/Setup	<input type="checkbox"/>								
Process	<input type="checkbox"/>								
Supplier	<input type="checkbox"/>								
Training	<input type="checkbox"/>								
Transport	<input type="checkbox"/>								
Unapproved	<input type="checkbox"/>								

FAULT CATEGORY

Landing Gear <input type="checkbox"/> Bearing <input type="checkbox"/> Center Not Concentric <input type="checkbox"/> Cracks <input type="checkbox"/> Critical 'Kink/Ripple/Wave <input type="checkbox"/> Cuff <input type="checkbox"/> Crumpling <input type="checkbox"/> Heat treatment <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Malfunction/Chatter <input type="checkbox"/> Turbulence Sequence <input type="checkbox"/> Warpage/Twist in Tube	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
--	--	---	--

Work Order ID 114479

Thursday, March 06, 2014 11:37:45 AM

114479

Page 8

Item ID: D212-664-201 Accept ***N900040100*** Setup Start ***NS1***
Revision ID: Stop ***NS2***
Item Name: Aft Crosstube - High
Start Date: 3/6/2014 Start Qty: 1.00 ***1*** Cust Item ID:
Required Date: 3/12/2014 Req'd Qty: 1.00 ***1*** Customer:
Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240 *240* QC Quality Control	QC5- Inspect part completeness to step on W/O Memo ***RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL HAS CURED FOR 72HOURS AS PER DWG.***	0.00 0.00		DAS 16 9-89 14/03/26					
250 *250* Packaging Packaging	Pick Kit Memo	0.00 0.00			DAS 32 9-89				14/3/27 (1) DAS 31 9-89
260 *260* QC Quality Control	QC4- 100% Inspect kits for completeness Memo	0.00 0.00		DAS 06 9-89					MAR 27 2014 (1)

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <table style="width:100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	<input type="checkbox"/>								
Doc/Data	<input type="checkbox"/>								
Equip/Tooling	<input type="checkbox"/>								
Handling/Pre	<input type="checkbox"/>								
Material	<input type="checkbox"/>								
Operator	<input type="checkbox"/>								
Offset/Setup	<input type="checkbox"/>								
Process	<input type="checkbox"/>								
Supplier	<input type="checkbox"/>								
Training	<input type="checkbox"/>								
Transport	<input type="checkbox"/>								
Unapproved	<input type="checkbox"/>								

FAULT CATEGORY

Landing Gear <input type="checkbox"/> Ber <input type="checkbox"/> Cer Not Concentric <input type="checkbox"/> Cra <input type="checkbox"/> Cri 'Kink/Ripple/Wave <input type="checkbox"/> Cuf <input type="checkbox"/> Cru ng <input type="checkbox"/> Hea reat <input type="checkbox"/> Insj tion Strip in Tube <input type="checkbox"/> Ma /Chatter <input type="checkbox"/> Tur g Sequence <input type="checkbox"/> We 'Twist in Tube	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
---	--	---	--

Work Order ID 114479***114479***

Page 9

Thursday, March 06, 2014 11:37:45 AM

Item ID: D212-664-201

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Aft Crosstube - High

Start Date: 3/6/2014 Start Qty: 1.00

1

Cust Item ID:

Required Date: 3/12/2014 Req'd Qty: 1.00

1

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

270

0.00

270

Packaging

Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPP D212-664-201

DAS
06
9-89

MAR 27 2014

280

0.00

280

QC

QC21- Final Inspection - Work Order Release

Memo

0.00

Quality Control

MLJ 14-03-28

MLJ 14-03-28

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <table style="width: 100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	<input type="checkbox"/>								
Doc/Data	<input type="checkbox"/>								
Equip/Tooling	<input type="checkbox"/>								
Handling/Pre	<input type="checkbox"/>								
Material	<input type="checkbox"/>								
Operator	<input type="checkbox"/>								
Offset/Setup	<input type="checkbox"/>								
Process	<input type="checkbox"/>								
Supplier	<input type="checkbox"/>								
Training	<input type="checkbox"/>								
Transport	<input type="checkbox"/>								
Unapproved	<input type="checkbox"/>								

FAULT CATEGORY

Landing Gear <input type="checkbox"/> Ber g <input type="checkbox"/> Cer Not Concentric <input type="checkbox"/> Cra <input type="checkbox"/> Crir 'Kink/Ripple/Wave <input type="checkbox"/> Cuf <input type="checkbox"/> Cru ng <input type="checkbox"/> He: reat <input type="checkbox"/> Insj tion Strip in Tube <input type="checkbox"/> Ma /Chatter <input type="checkbox"/> Tur g Sequence <input type="checkbox"/> Wa Twist in Tube	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
---	--	---	--

Picklist Print

Thursday, March 06, 2014 11:37:58 AM

Page 1

Work Order ID: 114479

114479

Parent Item: D212-664-201

D212-664-201

Parent Item Name: Aft Crosstube - High

Start Date: 3/6/2014

Required Date: 3/12/2014

Start Qty: 1.00

Required Qty: 1.00

Comments:

IPP Rev:E04.02.16ReformatK/DS

IPP Rev:F 06-03-29 Remove Coments on Pick List JLM

IPP Rev:G 07-04-30 As per Rev C JLM

IPP Rev:H 08-05-22 up date Qty of rubber cushion DD verified by:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D212-664- 201TRNRevC		Manufactured	No	B112783		110	Each	0.0000	1	1	JW	14-03-06	
D212-664-201TRNRevC									**				
Crosstube Turning Detail													
D3595-063-530		Manufactured	No			230	Each	37.0000	2	2			
D3595-063-530									**				
Rubber Cushion													

Location

Loc Qty

Loc Code

FG

5

82656

5

FP

8

111194

8

LG

18

110937

18

LG050

1

106512

1

LG051

5

110485

5

115317

4

14-03-23 CR

DQA: _____ Date: _____

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <table style="width: 100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design <input type="checkbox"/>									
Doc/Data <input type="checkbox"/>									
Equip/Tooling <input type="checkbox"/>									
Handling/Pre <input type="checkbox"/>									
Material <input type="checkbox"/>									
Operator <input type="checkbox"/>									
Offset/Setup <input type="checkbox"/>									
Process <input type="checkbox"/>									
Supplier <input type="checkbox"/>									
Training <input type="checkbox"/>									
Transport <input type="checkbox"/>									
Unapproved <input type="checkbox"/>									

FAULT CATEGORY

Landing Gear <input type="checkbox"/> Bend <input type="checkbox"/> Center Not Concentric <input type="checkbox"/> Crack <input type="checkbox"/> Kink/Ripple/Wave <input type="checkbox"/> Cuff <input type="checkbox"/> Cracking <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Malfunction/Chatter <input type="checkbox"/> Turbulence Sequence <input type="checkbox"/> Warpage/Twist in Tube	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence
---	--	---

<input type="checkbox"/> Outside Dimensions	<input type="checkbox"/> Pressure/Forced
<input type="checkbox"/> Over/Under tolerance	<input type="checkbox"/> Set-up
<input type="checkbox"/> Part Incorrect	<input type="checkbox"/> Temperature/Cure
<input type="checkbox"/> Part Lost/Missing	<input type="checkbox"/> Weld
<input type="checkbox"/> Part Moved	<input type="checkbox"/> Wrong Stock Pulled
<input type="checkbox"/> Positioned Wrong	
<input type="checkbox"/> Power Loss/Surge	<input type="checkbox"/> Other

Picklist Print

Thursday, March 06, 2014 11:37:58 AM

Page 2

Work Order ID: 114479

114479

Parent Item: D212-664-201

D212-664-201

Parent Item Name: Aft Crosstube - High

Start Date: 3/6/2014

Required Date: 3/12/2014

Start Qty: 1.00

Required Qty: 1.00

D2940-1

Manufactured No

230

Each

27.0000

2

2

D2940-1

AL 14-3-22

Support

Location

Loc Qty

Loc Code

LG052

9

103951

6

109042

3

LG53

18

109947

18

MS21920-28

Purchased

No

230

Each

106.0000

4

4

MS21920-28

AL 14-3-22

Clamp

Location

Loc Qty

Loc Code

FG

5

105884

5

LG050

101

M127061

1

M127544

11

M127785

3

M128129

44

M128363

42

D3428-1

Manufactured

No

250

Each

23.0000

1

1

D3428-1

*DAS
32
9-89*

14/3/22 (1)

Placard

Location

Loc Qty

Loc Code

ST042

23

107703

1

111100

10

112604

12

11/1/00

*DAS
31
9-89*

Thursday, March 06, 2014 11:37:58 AM

Shop Packet Print

Page 2

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____

Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS			
			Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Thermoforming <input type="checkbox"/> Large Fab <input type="checkbox"/>	Crosstube <input type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> Composite <input type="checkbox"/>	Water Jet <input type="checkbox"/> Prod. Eng. Coord. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/>	Engineering <input type="checkbox"/> Quality <input type="checkbox"/> Other <input type="checkbox"/>

Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	<input type="checkbox"/>								
Doc/Data	<input type="checkbox"/>								
Equip/Tooling	<input type="checkbox"/>								
Handling/Pre	<input type="checkbox"/>								
Material	<input type="checkbox"/>								
Operator	<input type="checkbox"/>								
Offset/Setup	<input type="checkbox"/>								
Process	<input type="checkbox"/>								
Supplier	<input type="checkbox"/>								
Training	<input type="checkbox"/>								
Transport	<input type="checkbox"/>								
Unapproved	<input type="checkbox"/>								

FAULT CATEGORY

Landing Gear <input type="checkbox"/> Bend <input type="checkbox"/> Not Concentric <input type="checkbox"/> Crack <input type="checkbox"/> Kink/Ripple/Wave <input type="checkbox"/> Cuff <input type="checkbox"/> Cracking <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Malfunction <input type="checkbox"/> Turbulence Sequence <input type="checkbox"/> Warpage	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
--	--	---	--

Picklist Print

Thursday, March 06, 2014 11:37:58 AM

Work Order ID: 114479

114479

Parent Item: D212-664-201

D212-664-201

Parent Item Name: Aft Crosstube - High

Start Date: 3/6/2014

Required Date: 3/12/2014

Start Qty: 1.00

Required Qty: 1.00

MS21042L6

Purchased

No

250

Each

211.0000

6

6

DAS
32
9-89

MS21042L6

Nut

DAS
06
9-89

Location

Loc Qty

Loc Code

ST314

211

m127304

2

m127831

26

m127904

183

m127904

DAS
31
9-89

NAS1149D0663J

Purchased

No

250

Each

2,061.000

18

18

DAS
32
9-89

NAS1149D0663J

Washer

DAS
06
9-89

Location

Loc Qty

Loc Code

ST294

7

123265

4

M126284

3

ST510a

2054

M126334

699

M127813

655

M127916

700

m127813

DAS
31
9-89

AN6-40A

Purchased

No

250

Each

49.0000

4

4

DAS
32
9-89

AN6-40A

Bolt

DAS
16
9-89

Location

Loc Qty

Loc Code

ST504

49

M127817

49

m127817

DAS
31
9-89

AN6-41A

Purchased

No

250

Each

28.0000

2

2

DAS
32
9-89

AN6-41A

Bolt

DAS
16
9-89

Location

Loc Qty

Loc Code

ST340

28

M126180

28

m126180

DAS
31
9-89

Thursday, March 06, 2014 11:37:59 AM

Shop Packet Print

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Suspected Unapproved <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <table style="width: 100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

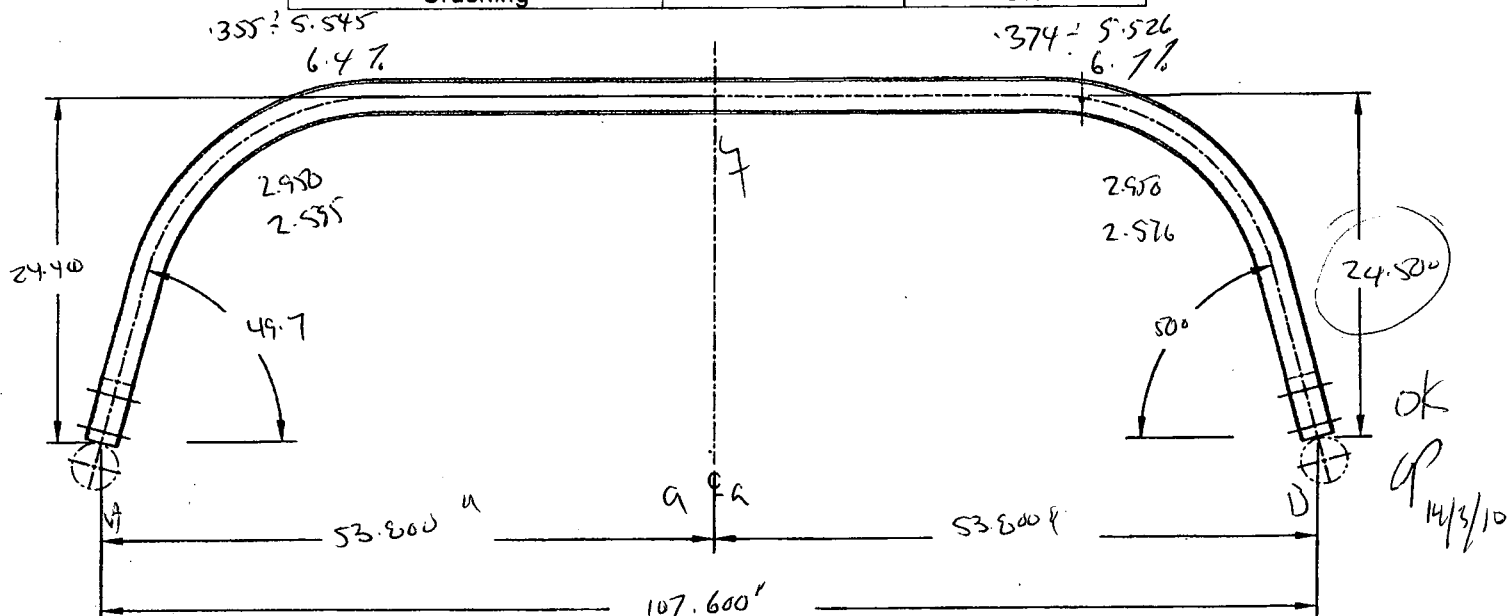
Root Cause	D	Step	Qty	Description of work order update or non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Design	<input type="checkbox"/>								
Doc/Data	<input type="checkbox"/>								
Equip/Tooling	<input type="checkbox"/>								
Handling/Pre	<input type="checkbox"/>								
Material	<input type="checkbox"/>								
Operator	<input type="checkbox"/>								
Offset/Setup	<input type="checkbox"/>								
Process	<input type="checkbox"/>								
Supplier	<input type="checkbox"/>								
Training	<input type="checkbox"/>								
Transport	<input type="checkbox"/>								
Unapproved	<input type="checkbox"/>								

FAULT CATEGORY

Landing Gear <input type="checkbox"/> Bend <input type="checkbox"/> Not Concentric <input type="checkbox"/> Kink/Ripple/Wave <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drawing <input type="checkbox"/> Drill Holes <input type="checkbox"/> Finish <input type="checkbox"/> Fit/Function	<input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete/Unqualified <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Off-set <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Outside Dimensions <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Set-up <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other
--	--	---	--

DART AEROSPACE LTD		Work Order:	114429
Description: Crosstube High Aft (205/212)		Part Number:	D212-664-201
Inspection Dwg: D212-664-241 Rev: D		Page 1 of 1	

Required Dimension	Min	Max
Height	24.17	24.43
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.70
Bending Passes	5	--
Crushing	--	6%



	Side A	Middle	Side B
Bending Passes	9	7	9
Crushing	6.47%		6.71%
Comments			
Side A = 6.47% crushing @ 9 Passes			
Middle = 7 Passes			
Side B = 6.71% crushing @ 9 Passes			

QC15 Inspection	DAS
Date	16 14/03/10

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.05.08	Dimensions updated per Dwg rev. C	KJ/JLM	
C	10.04.01	Dwg Rev updated	KJ	
D	12.04.16	Added bending, crushing dimensions	KJ	

Item	Qty -241	Qty -241B	Part Number	Description
1	X		D212-664-241	CROSSTUBE ASSEMBLY (205/212 HIGH AFT)
2		X	D212-664-241B	CROSSTUBE ASSEMBLY (214 HIGH AFT)
3	1	1	D6006-129	CROSSTUBE
4	2	2	D2940-1	SUPPORT
5	4	4	D3595-063-530	RUBBER CUSHION
6	4	4	MS21920-28	CLAMP (OR MS21920-30)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6006-129
FINISHED LENGTH = 124.362±0.020
- FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: D212-664-241 = 44.2 lbs (PER IIN-D212-664)
D212-664-241B = 44.2 lbs (PER IIN-D212-664)
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- BEND PROGRESSIVELY WITH A MINIMUM OF 5 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D2940-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

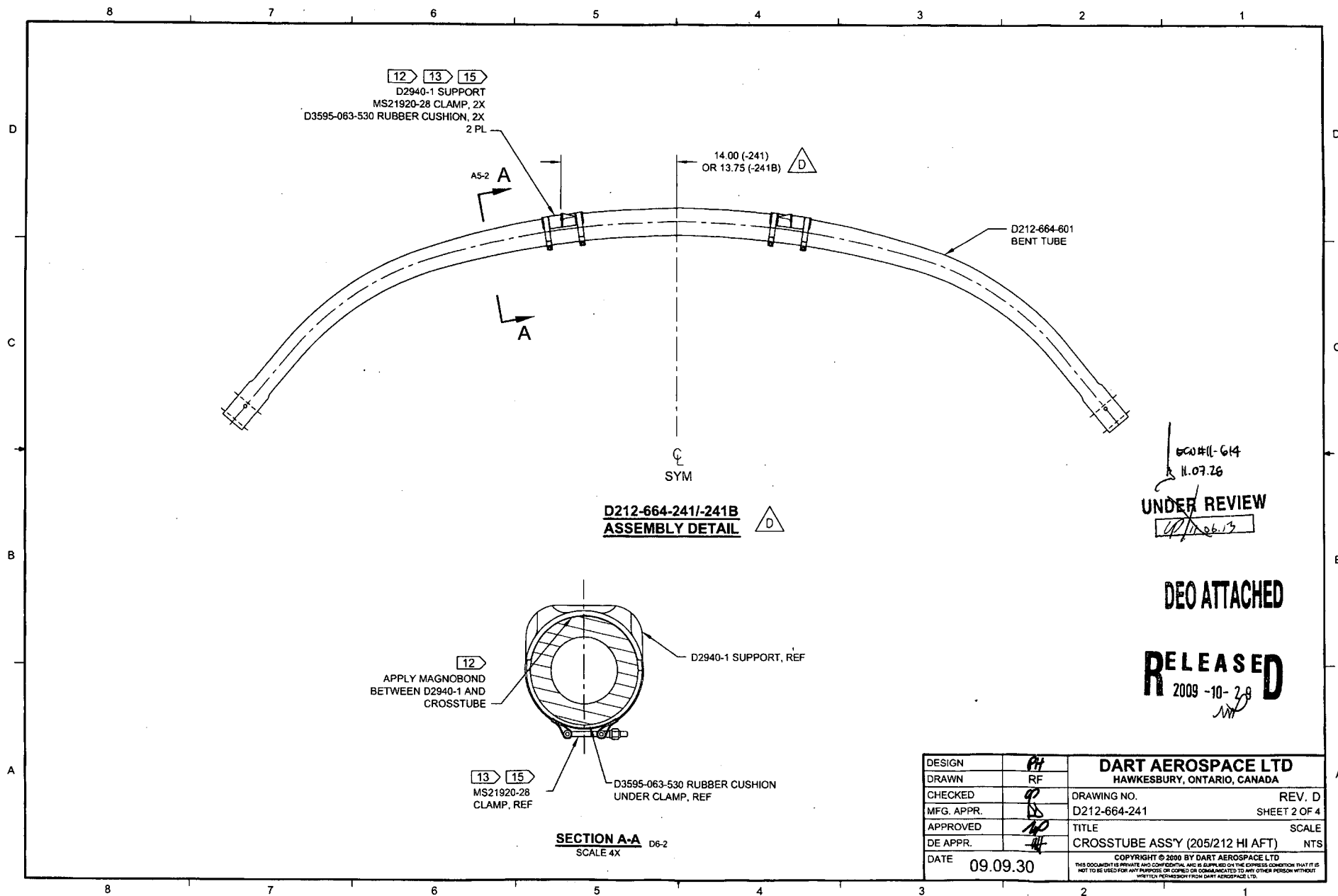
D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -241B (ZN D4-2, B4-2); REMOVED REF & ADD TOLERANCES (ZN D8-3 & C4-3; C6-3 & A8-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -1009 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN	PH	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA DRAWING NO. D212-664-241 TITLE CROSSTUBE ASSY (205/212 HI AFT) DATE 09.09.30	
DRAWN	RF		
CHECKED	PH		
MFG. APPR.	PH		
APPROVED	PH		
DE APPR.	PH	REV. D SHEET 1 OF 4 SCALE NTS	

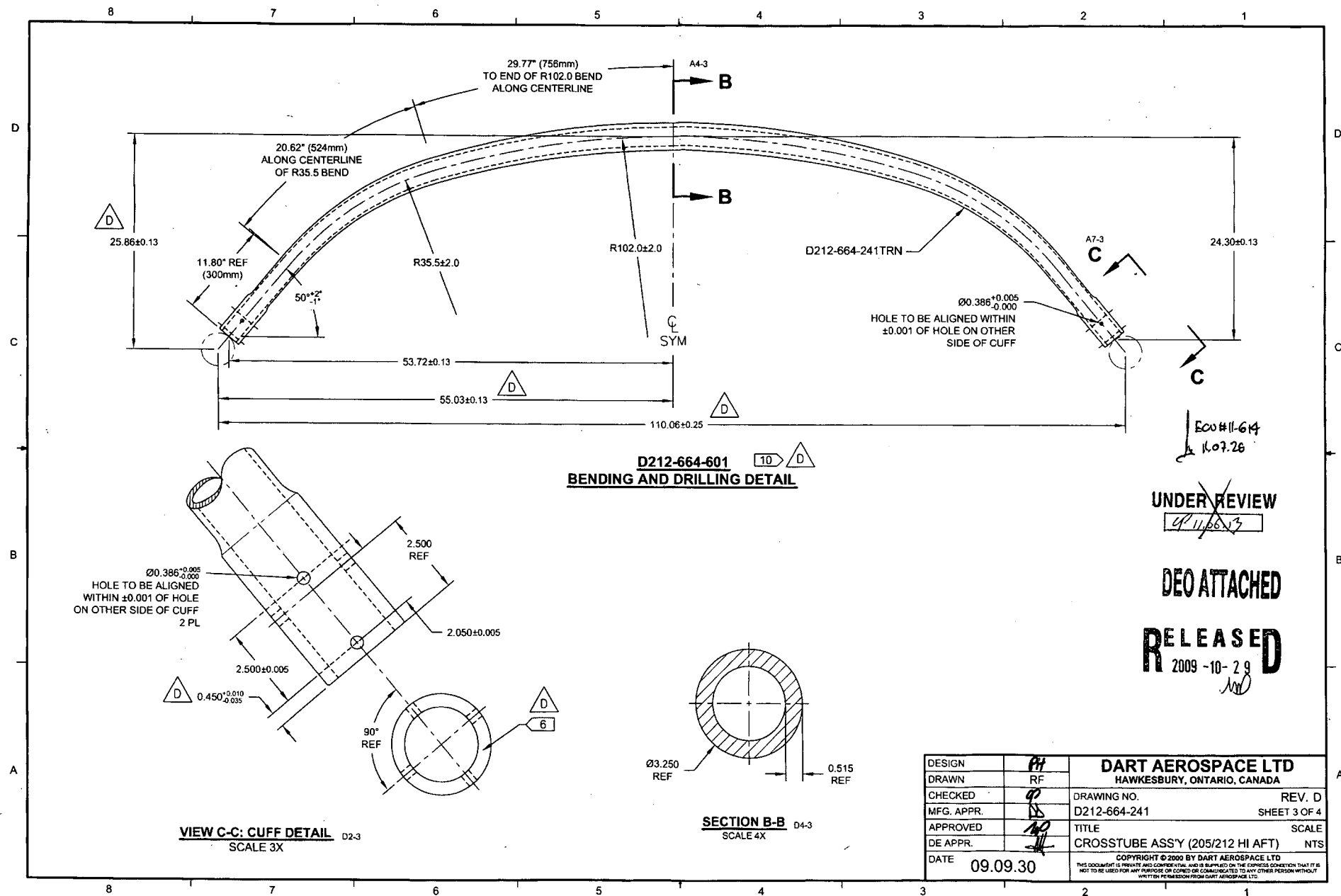
600 #11-614
11.08.25
UNDER REVIEW
09.09.30

DEO ATTACHED

RELEASED
2009-10-29
MY

114479 MLS
14-03-08





DRAWING NO. D212-664-241	TITLE CROSSTUBE ASSY (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-241-D-1	SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN	CHECKED	MFG. APPR.	APPROVED	DE APPR.			
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12	DATE 11.04.12			

PURPOSE:

ADD AN INSPECTION WINDOW TO UNDERSIDE OF CROSSTUBE.

CHANGE:

NOTES 2 OF SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND
PAINT OUTSIDE PER DART QSI 005 4.2
REMOVE MASKING AND APPLY CLEAR COAT

WAS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2

RELEASED
2011-04-18

UNDER REVIEW

11.06.13

ECN#1-614

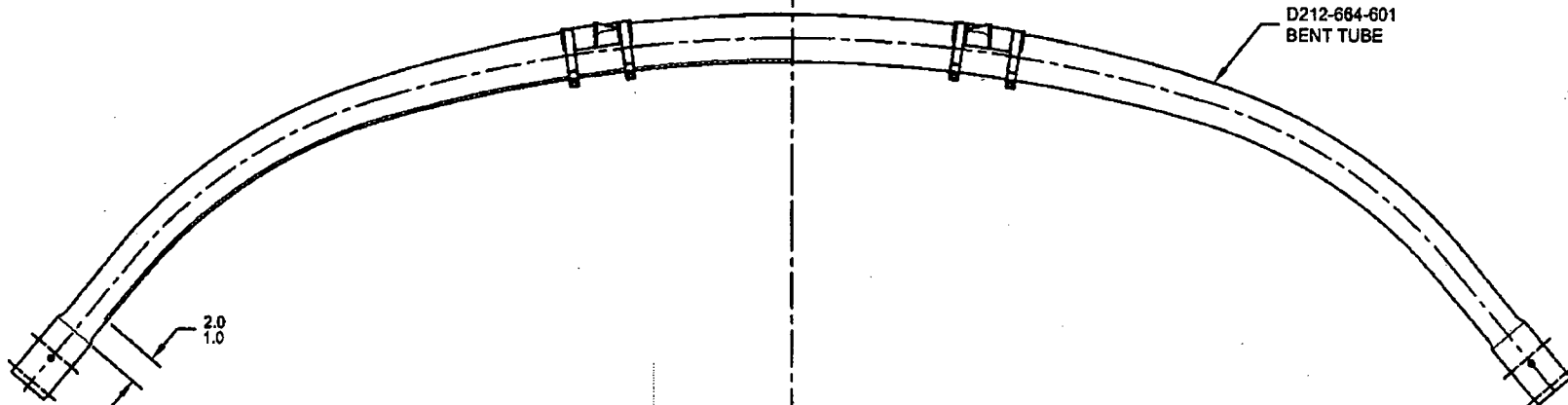
11.07.28

COPYRIGHT © 2011 BY DART AEROSPACE LTD

THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.

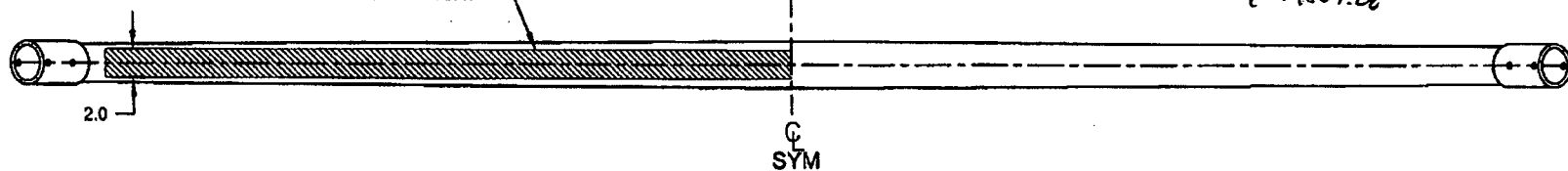
DRAWING NO. D212-664-241	TITLE CROSSTUBE ASSY (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-241-D-1	SHEET NO. SHEET 2 OF 2	SCALE NTS
DRAWN	CHECKED <i>UP</i>	MFG. APPR. <i>E</i>	APPROVED <i>MD</i>	DE APPR. <i>MD</i>			
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12	DATE 11.04.12			

IS:



**D212-664-241/-241B
ASSEMBLY DETAIL**

MASK AREA PRIOR TO PAINTING,
REMOVE MASKING AFTER PAINT
AND APPLY CLEAR COAT



RELEASED
2011-04-18

UNDER REVIEW

UP 11.06.13
002#11.06.13
11.07.28

DRAWING NO. D212-664-241	TITLE CROSSTUBE ASS'Y (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-241-D-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>q</i>	CHECKED <i>ASS</i>	MFG. APPR. <i>[Signature]</i>	APPROVED <i>[Signature]</i>		DE APPR. <i>[Signature]</i>		
DATE 11.07.15	DATE 11.07.20	DATE 11.07.21	DATE 11/07/21		DATE 11-07-21		

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

CHANGE:

IS:

Item	Qty -241	Qty -241B	Part Number	Description
7	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

WAS:

7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
---	-----	-----	----------------	---

NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

12) TO INSTALL D2940-1 SUPPORT: ABRABE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.

15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. **PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.**

WAS:

12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.

15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
2011-07-28
[Signature]

212-664-201 "Folio"

Batch#:

Setup

Rollers 3.25 x 3 ****without spacers***

Large Table, Shims 1.85" for SA bend, shims 1.7" for SB bend (new buggy)/adjust supporting rollers as required.

From cuffs, mark tube @ 32.1875 & **35.1875 RED** and center line

Middle Bend

Start bending on 32.1875 line w/tube on LARGE TABLE. Approach from this line is **2775 on both Y&W**. Use programs middle auto.

Bend middles even to reference line on reference board in order for side programs to be effective.

Side bends

Start bending on **35.1875** line with long part of tube on LARGE TABLE. approach of **Y 1900 W 3735**

Run programs s01-s05 without stopping, CHECK, then s06 to 16 to finish. CHECK between each program..

Approach for Prog s06 to s16 is Y 2190 and W 3735

CHANGED 35.187 LINE TO 34.9, did not work! DP 11-8-11

11/11/02 tried new tangent line today. tube was far too high. nearly scrapped. 24.75 on one side, 24.5625 on the other. max tolerance is 24.43. jw

12/05/29 NOW USING ORIGINAL TANGENT LINES AGAIN

12-9-13 bent one tube. used original tangent lines. ran 212aMauto. then middlesfix. tube was very close to even on both sides of middle, one a hair under the reference line, and one a hair over. from there sides were run as per folio, then 5c,6,7,8,9,10 to finish. height and span were both close to nominal.

Passes:

1
2
3
4
5
5c
6
7
8
9

Mauto
Mfix
Mfix 2
7

1
2
3
4
5
5c
6
7
8
9

D212-664-241 Crosstube Flattening Tolerance Analysis

The following calculation is used to justify Crosstube flattening up to 7.1%. Since the Crosstubes are primarily under bending loads, the cross section with 7.1% crushing will be compared to a round cross section inboard of the location of the flattening as shown in Figure 1.

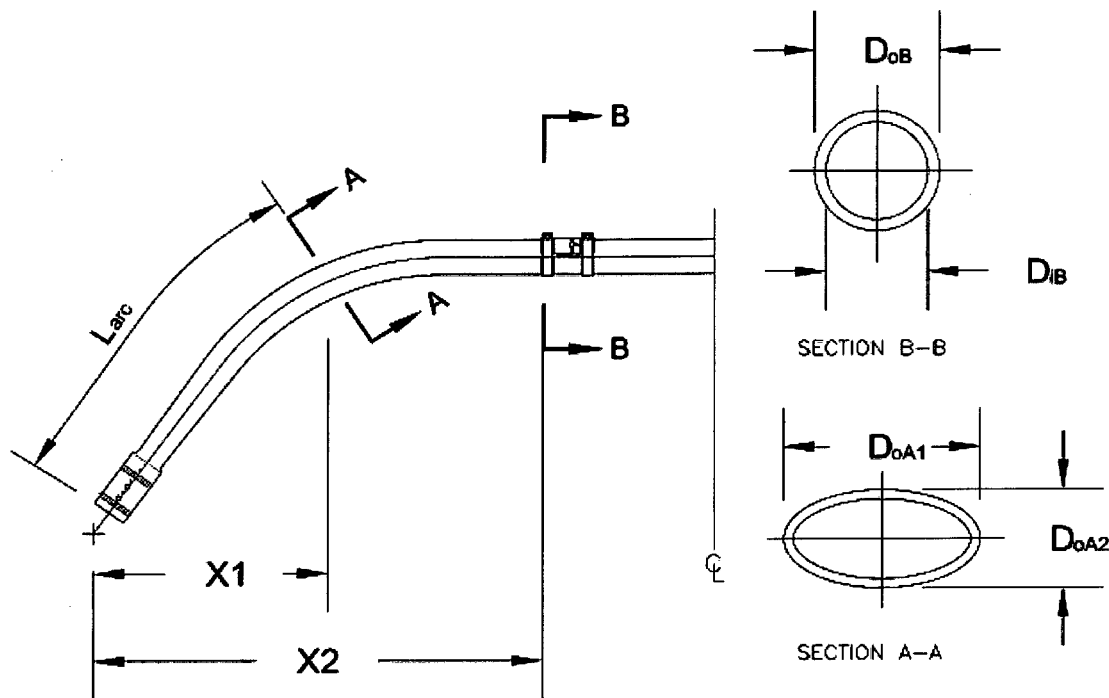


Figure 1- Analysis model

$D_{oB} := 3.25 \cdot \text{in}$	Nominal outer diameter of Section B-B (See Figure 1)
$D_{iB} := 2.22 \cdot \text{in}$	Nominal inner diameter of Section B-B (See Figure 1)
$D_{iA} := D_{iB}$	Nominal inner diameter of Section A-A (See Figure 1)
$t_{wB} := .515 \cdot \text{in}$	Nominal wall thickness at Section B-B
$t_{w, \text{tolerance}} := 0.020 \cdot \text{in}$	Wall thickness tolerance of material (+/-)
$OD_{\text{tolerance}} := 0.008 \cdot \text{in}$	Outer diameter tolerance of material (+/-)
$ID_{\text{max}} := D_{iB} - t_{w, \text{tolerance}}$	Maximum inner diameter
$ID_{\text{min}} := D_{iB} + t_{w, \text{tolerance}}$	Minimum inner diameter
$X_1 := 14.31 \cdot \text{in}$	Reference dimension (See Figure 1) , center of arc
$X_2 := 48.18 \cdot \text{in}$	Reference dimension (See Figure 1)
$L_{\text{arc}} := 22.51 \cdot \text{in}$	Reference dimension (See Figure 1)

Note: The above data was obtained from Dart drawings D212-664-241 Rev. D and D6006 Rev. A

1.0 Sectional Properties of Section A-A

Since the Crosstube is tapered along its length before it is bent, the outer diameter before bending must be determined, by assuming a linear taper. data points are taken from Dart drawing D350-748-141 to determine the change in taper along the length of the crosstube.

$X_1 := 22.105 \cdot \text{in}$	Linear data point 1 (Ref Dart Drawing D350-748-141 Sheet 4)
$X_2 := 27.260 \cdot \text{in}$	Linear data point 2 (Ref Dart Drawing D350-748-141 Sheet 4)
$Do_1 := 2.854 \cdot \text{in}$	Diameter at point 1 (Ref Dart Drawing D350-748-141 Sheet 4)
$Do_2 := 2.938 \cdot \text{in}$	Diameter at point 2 (Ref Dart Drawing D350-748-141 Sheet 4)

Theoretical outer diameter before bending at Section A-A is given by,

$$D_{o,A} := \frac{Do_2 - Do_1}{X_2 - X_1} \cdot (L_{\text{arc}} - X_1) + Do_1$$

$$D_{o,A} = 2.861 \cdot \text{in}$$

Using the theoretical outer diameter before bending and knowing that the crushing will be 7.1%, dimensions of the major and minor axis for the elliptical section A-A shown in Figure 1 can be determined as follows,

$C\% := 0.071$	Percentage of flattening
$D_{oA1} := D_{o,A} + (D_{o,A} \cdot C\%)$	Long axis of ellipse (See Figure 1)
$D_{oA1} = 3.064 \cdot \text{in}$	
$D_{oA2} := D_{o,A} - D_{o,A} \cdot C\%$	Short axis of ellipse (See Figure 1)
$D_{oA2} = 2.657 \cdot \text{in}$	

The most conservative wall thickness at Section A-A can be determined as follows,

$$t_{wA} := \frac{D_{o,A} - ID_{\text{max}}}{2}$$

$$t_{wA} = 0.33 \cdot \text{in}$$

Moment of inertia for Section A-A

$$I_A := \left[\frac{3.1416}{4} \cdot \frac{D_{oA1}}{2} \cdot \left(\frac{D_{oA2}}{2} \right)^3 \right] - \frac{3.1416}{4} \cdot \left(\frac{D_{oA1}}{2} - t_{wA} \right) \cdot \left[\left(\frac{D_{oA2}}{2} - t_{wA} \right)^3 \right]$$

$$I_A = 1.883 \cdot \text{in}^4$$

2.0 Sectional Properties of Section B-B

$$I_B := \frac{3.1416}{64} \cdot \left[(D_{oB} + OD_{tolerance})^4 - ID_{min}^4 \right]$$

$$I_B = 4.295 \cdot \text{in}^4$$

3.0 Maximum Stress at Section A-A

$$S_{maxA} := \frac{X_1 \cdot D_{oA} \cdot 1 \cdot \text{lb}}{2 \cdot I_A}$$

Maximum stress assuming unit load

$$S_{maxA} = 10.869 \cdot \frac{\text{lb}}{\text{in}^2}$$

4.0 Maximum Stress at Section B-B

$$S_{max} := \frac{X_2 \cdot (D_{oB} + OD_{tolerance}) \cdot 1 \cdot \text{lb}}{2 \cdot I_B}$$

Maximum stress assuming unit load

$$S_{max} = 18.274 \cdot \frac{\text{lb}}{\text{in}^2}$$

5.0 Margin of Safety

$$MS := \frac{S_{max}}{S_{maxA}} - 1$$

$$MS = 0.681$$

Therefore flattening on the bent section by 7.1% is structurally acceptable based on a positive margin of safety.

